

script was prepared by Dr. Cooke. There is very much that is interesting in this volume, but upon the whole the book is a disappointing one. The editor states that the work is intended for students, but we fear that the junior student will be repelled rather than attracted by the hosts of scientific names of genera and species which crowd many of the pages with italics. Then we cannot but condemn the mode of arrangement of the contents.

The mode of division of the work renders it quite impossible for the reader to obtain any connected account of the life-history of one single species. This we consider a very grave defect indeed. To trace the life-history of one form we may have to refer to the chapters on the "Structure," "Germination and Growth," "Sexual Reproduction," and "Polymorphism" before we can obtain what we want. This ought not to be, and we venture to think Dr. Cooke would have rendered his book much more useful if he had given connected life-histories of the most interesting and best known forms.

Some of the omissions have rather surprised us. For example, we do not find any account of the yeast plant, a form which most students of biology will do well to study carefully. The rather meagre index does not contain the words "Yeast," "Torula," "Hormiscium," or "Saccharomyces," although the word "yeast" occurs in the first chapter. Then there is no account of the life-history of the ergot of rye. Its life-history is perfectly well known, and most students, whether medical or not, ought to have some knowledge of it.

The book is evidently the work of a systematic rather than a morphological botanist, and this may account for some of the errors that have been made. For example, the process of conjugation and formation of zygospores in the *Mucor* is quite correctly described, but in what way can Dr. Cooke apply the term conjugation to the fertilisation of the oogonium by the antheridium in *Achlya* and *Peronospora* as figured on pages 169 and 171? The formation of the ascogonium of *Eurotium Aspergillus-glaucus* is only slightly indicated on p. 189, while the pollinodium is altogether omitted. The classification is that given in Cooke's "Handbook," but, for the use of the student, we do not think it equal to that given in Grisebach and Reinke's translation of Oersted's "System der Pilze," &c.

The Lichen-theory also receives a share of attention; Schwendener and his followers are condemned for the "sensational romance of lichenology," as it has been called. Truth, however, is often stranger than fiction; and if anyone would take the commonest lichen he can find and give botanists a complete account of its life-history, he would earn the gratitude not only of all algologists, fungologists, and lichenologists, but of botanists generally.

The chapters on the "Uses," "Notable Phenomena," "Influences and Effects," "Habitats," "Cultivation," "Geographical Distribution," and "Collection and Preservation," are very valuable; and if the other chapters had been run together into connected life-histories, we think the work would have been an admirable one. As it is, it cannot fail to interest and instruct, and every page bears evidence of the extensive and accurate knowledge of the author. The freedom from errors of the press in the names of the fungi shows the care with which the

work has been revised and edited. The illustrations are numerous and good, but there are a few old faces among them whose absence would not have greatly grieved us.

MM. H. AND E. MILNE-EDWARDS'S NEW WORK ON MAMMALS

Recherches pour servir à l'histoire naturelle des Mammifères comprenant des considérations sur la classification de ces animaux: par M. H. Milne-Edwards: *des observations sur l'hippopotame de Sibéria et des études sur la Faune de la Chine et du Tibet Oriental*: par M. Alphonse Milne-Edwards. Two vols. 4to., text and plates. (Paris: G. Masson, 1868-74.)

LAST year we called our readers' attention to the zoological researches lately made in the Tibeto-Chinese province of Moupin, by the French traveller, Armand David,* and to the particular importance of his discoveries in the class of Mammals. The work now before us gives a complete account of the many new forms the knowledge of which we owe to the energy of this excellent traveller and naturalist, besides other important contributions to the history of the same class of animals.

The work commences with an essay by the veteran zoologist, M. H. Milne-Edwards, upon the general classification of Mammals. The system here propounded, which has many good points, and embraces details already put forward by the author in previous writings, is not one that we think will meet with very general approval. Its chief feature is the elevation of the marine or pisciform Mammals (containing the two orders of Sirenians and Cetaceans) to a second sub-class equivalent in value to the normal Mammals on the one hand and to the Marsupials on the other, and the degradation of the Monotremes to a mere subdivision of the latter. Prof. Huxley's views as to the relative position of these groups, not to speak of his general arrangement of the class, appear to us to be much more easily justifiable.

The main body of the work consists of three memoirs by M. Alphonse Milne-Edwards, a worthy son of his distinguished father, illustrated by a long series of well-executed plates, which constitute the second volume. The first of these memoirs contains observations upon the hippopotamus of Liberia—a smaller form of the animal now so well known to us from the exhibition of living specimens in the Zoological Society's Gardens, and in other collections. First described in America in 1844, the smaller hippopotamus remained entirely unknown in Europe until within the last few years, when specimens were procured for the Jardin des Plantes by the exertions of Prince Napoleon when Minister of the Colonies. The figure now given by M. Milne-Edwards is the first that has been published of the entire animal, and the general skeleton is likewise now for the first time described, only the cranium having been known to the American naturalists.

M. Alphonse Milne-Edwards's second essay is entitled "Études pour servir à l'histoire de la Faune Mammalogique de la Chine," and is based upon collections trans-

* NATURE, vol. x. p. 32 (May 14, 1874)

mitted from the North of China by M. de Montigny, M. Fontanier, and M. l'Abbé Armand David, especially those of the last-named traveller, who devoted several years to zoological researches in the country north of Pekin, and in the distant parts of Mongolia. The series of Mammals here treated of is of especial interest as supplementing the discoveries recently made by Russian naturalists in Central and Eastern Siberia. The forms are chiefly those characteristic of the steppe-regions of the great northern continent of the Old World, such as *Siphneus*, *Cricetus*, *Dipus*, and *Spermophilus*. A full account is also given of the deer of this district, as also of the larger and smaller cats. Amongst the latter are enumerated the Ounce (*Felis irbis*), of which examples were obtained by M. Fontanier, and two species described and figured as new, under the names *Felis microtis* and *F. tristis*. Lastly, M. Milne-Edwards records the existence in the mountains situated in the east of the province of Tchéli (as testified by M. Fontanier) of a singular species of ape of the genus *Macacus*, which he designates *M. ichelensis*. Considering that the province of Tchéli is nearly on the same isothermal line as Paris, the discovery of this animal is not a little remarkable.

The concluding essay of the volume relates to a still more novel mammal fauna than that of Pekin. Among the Yung-Ling Mountains, in the far interior of China, lies the little-known principality of Moupin, which we have already alluded to. Here the Abbé David, after a stay of several years in Northern China, established himself for a year in one of the large valleys at an elevation of about 6,000 feet above the sea-level, and in the midst of peaks ranging up to above 15,000 feet of altitude. Of the wonderful discoveries which he here made we have already learnt something from the preliminary notices of M. Alphonse Milne-Edwards on this subject. In the present memoir, detailed accounts are given of the many strange forms of which specimens were obtained by M. David in this district. Excellent illustrations, not only of the entire animal, but also of its characteristic parts, add greatly to the value of the descriptions, and we now become acquainted for the first time with the singular appearance of *Rhinopithecus roxellana*, a long-haired monkey with a "tip-tilted" nose, which inhabits the mountain-forests of Moupin; with *Nectogale elegans*, a new aquatic insectivore of the same district; with *Scaptonyx*, a new genus of the Mole family, from the confines of Setchuen; and with *Ailuropus melanoleucus*, from the inaccessible mountains of Eastern Thibet.

The last-named animal, which in external appearance presents some resemblance to a large white bear with a black band across the back, is most nearly allied to the Panda (*Ælurus*) of the Himalayas, and belongs to the same peculiar family of Carnivores. Besides these, we have an account of *Elaphodus*, a new genus of ruminants, belonging to the Deer family, but with very diminutive horns; and of many other new and interesting Mammals, which show that the fauna of this part of Thibet is in many respects akin to that of the southern slope of the Himalayas. On the whole, we think there can be no question that the present work is one of the most important contributions that has lately been made to zoological science, and reflects the greatest credit upon its accomplished authors.

OUR BOOK SHELF

An Introduction to Human Anatomy. By William Turner, M.D. (Edinburgh: Adam and Charles Black, 1875.)

PROF. TURNER having written the article "Anatomy" in the first volume, recently published, of the ninth edition of the "Encyclopædia Britannica," has, at the suggestion of the publishers, reproduced it in a separate form, the first half of which we have received as a compact volume of some 400 pages.

This part contains an account of the skeleton, joints, muscles, nervous system, and organs of special sense, together with a chapter on the minute anatomy of the different tissues of the human body. The descriptions are short and make no pretensions to extreme minuteness, as may be judged from the following reference to the atlas:—"The first (vertebra) or *atlas*, has no body or spine: its ring is very large, and on each side of the ring is a thick mass of bone, the *lateral mass*, by which it articulates with the occipital bone above and the second vertebra below." In the account of the muscles also the space devoted to each is frequently little more than that required for the mention of the name:—"The supinator and pronator muscles (of the fore-arm) are all inserted into the radius; the supinators are the supinator longus, supinator brevis, and the biceps; the pronators are the pronator teres and the pronator quadratus." The nervous system has received more attention, and the general description of the brain, together with that of its more intimate structure, is fairly full. The author's valuable observations on the cerebral convolutions, together with his investigations on the relation of these to the walls of the bony cranium and the sutures, receive their due share of notice, and are here collected together for the first time. The chapter on the organs of special sense are also well worthy of study. In the histology we cannot help thinking that almost too much credit is given to a young and promising microscopist, some of whose results are still, however, decidedly *sub judice*.

We find it difficult to decide mentally to what class of students the work before us will be of most value. To the ordinary medical student who has but a couple of years in which to fully master the subject of human anatomy, the detail will not be sufficient, and one of the text-books will be more useful. To the amateur reader there is a mass of technical terms which he will have to attempt to wade through, almost certainly without success, both on account of their number and, to him, their meaninglessness. To the special investigator of the anatomy of the nervous centres the chapter devoted to that subject will be extremely valuable, as the whole work will be to the advanced student who desires to take a rapid last glance through his subject before competing for a high examination place.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

On the "Law of Fatigue" regulating Muscular Exertion

IN NATURE, vol. xi. pp. 256 and 276, Mr. Frank E. Nipher, of the University of Iowa, has published some interesting observations bearing on the "Law of Fatigue" which regulates muscular exertion, and criticises the use which I have made of some experiments published by him, one series of which seemed to me to be highly confirmatory of the "Law of Fatigue" which I had previously established on the basis of other experiments carefully made, and quite different in principle.

The "Law of Fatigue" is thus stated by me in "Principles of Animal Mechanics," p. 442:—"Law III. When the same muscle (or group of muscles) is kept in constant action until fatigue sets